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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/815,282

03/23/2001

Kouichi Nagai

010391

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7590

01/30/2004

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EXAMINER

GURZO, PAUL M

ART UNIT

PAPER NUMBER

2881

DATE MAILED: 01/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/815,282

Applicant(s)

NAGAI ET AL.

Examiner

Paul Gurzo

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 and 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otaka et al. (5,412,209).

Regarding claims 1 and 12, 209 teaches a scanning electron microscope and method of controlling a scanning electron microscope comprising an irradiating unit that irradiates an object (12) with an electron beam, and a detecting unit (30) that detects electron released from the object (12) due to irradiation at the appropriate magnification for observing the object (col. 5, line 33 - col. 6, line 50, col. 8, lines 55-58, col. 12, lines 25-38, and Fig. 1). 209 teaches that the electron beam is irradiated on the surface for a predetermined period based on the magnification (col. 12, lines 25-38), and Fig. 15 depicts the desired period depending on the magnification. Further, because this period, which is dependent on the magnification for observation, is determined prior to the irradiation of the electron beam (step S 15), the irradiation time may change, but the scanning rate obviously stays constant. In addition, the specification teaches that the scanning rate is always 10 frames or more/second (claim 16), thus teaching that the scanning rate is unchanged even when the period is changed based on the magnification. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to

keep the scanning rate unchanged because this will lead to increased control of the scanning electron microscope.

Regarding claims 2-7 and 13-18, as the claimed invention is best understood in view of the specification, 209 teaches extracting image data and displaying it in accordance with the extracted image data (col. 9, lines 55-58), and it is inherent that the image is displayed using only the desired stored data. Further, it is obvious that the magnification and period are correlated and the magnification varies based on the measured values and is changed as needed based on a threshold value so that detection is accurate with minor error distribution (col. 12, lines 25-38).

Claims 8-11 and 19-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otaka et al. (5,412,209), and further in view of Nakagaki et al. (6,476,388).

Regarding claims 9,10,20, and 21, as the claimed invention is best understood in view of the specification, 209 teaches a scanning electron microscope and method of controlling a scanning electron microscope comprising an irradiating unit that irradiates an object (12) with an electron beam, and a detecting unit (30) that detects electron released from the object (12) due to irradiation as applied above. It is obvious that 209 teaches a first scanning range, but it does not explicitly teach a second scanning range in a second direction.

However, 388 teaches a first position coordinate and a second position coordinate that are irradiated by an electron beam and the appropriate image is extracted and displayed (col. 4, lines 39-67). It is obvious that the first and second positions can be viewed as first and second scanning ranges and that scanning occurs in two different directions (raster scanning). In addition, 388 teaches the use of appropriate high and low magnification and it is obvious that the desired time intervals are used with regard to the first and second scanning ranges. They also

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teach time intervals for scanning ranges based on low and high magnification modes (col. 30, line 49 - col. 31, line 9). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a first and second scanning range because these values can be used to determine a correcting coefficient that can be used for accurate irradiation to increase defect detection and subsequent imaging.

Regarding claims 8 and 19, 388 teaches as first and second magnification (high and low) and it is obvious that these magnifications are determined based on the appropriate values that are obtained (col. 4, lines 29-67).

Regarding claims 11 and 22, 388 teaches a switching control unit for controlling to switch at least scanning means so as to be obtained a digital image signal of a low magnification based on a wide image taking field of view and a digital image signal of a high magnification based a narrow image taking field of view being switched from an A/D conversion unit, and a beam spot diameter control unit for controlling to switch a spot diameter of an electron beam at a surface of an object substrate in controlling to switch the signals by the switching control unit or a beam spot diameter control unit for controlling the beam spot of the electron beam based on information concerning a surface texture on an image taking portion of the object substrate in taking an image thereof in a wide image taking field of view by controlling to switch the signals by the switching control unit (col. 3, lines 12-29). The wide and narrow images that are taught are viewed as a first and second scanning range, and it is obvious that the image that is taken of the scanning range is taken with data that falls within the desired range.

Regarding claims 23-25, the above-applied prior art teaches the claimed irradiation, detection, and image acquisition without changing the scanning rate as described above, and 388

teaches that the use of a low magnification mode for acquiring an image and a high magnification mode for taking and storing an image that is indicative of the detected defects (col. 4, lines 29-67). The second, narrow image is a sub-region of the object, and an image of this region is formed as taught above, and the image can be used to measure and detect defects and pattern size. In addition, 209 also teaches that the electron beam is irradiated on the surface for a predetermined period based on the magnification (col. 12, lines 25-38), and it is obvious that the magnification and period will vary accordingly.

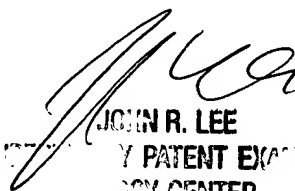
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Gurzo whose telephone number is (571) 272-2472. The examiner can normally be reached on M-Fri. 7:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Lee can be reached at (571) 272-2477. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

PMG
January 20, 2004


JOHN R. LEE
SUPERVISOR
PATENT EXAMINER
TECHNOLOGY CENTER